REMARKS

Claims 1-22 are pending in the present Application. Applicant has amended claims 1, 7, 9, 10, 17, 19 and 22. Applicant has canceled claim 8. Applicant has also added claims 23, 24, 25, 26 and 27. Consequently, claims 1-7 and 9-27 remain pending in the present Application.

Applicant has amended the specification to correct minor errors. Applicant has amended independent claims 1, 9, 10, 19 and 22 to recite that it is determined whether the focus zone can be shifted to ensure that at least one object is out of focus. Support for the amendments to claims 1, 9, 10, 19 and 22 and for new claims 23-27 can be found in the specification, page 18, lines 8-20. Applicant has also amended claims 7 and 8 to ensure that proper antecedent basis is present for all steps of the claims. Applicant has amended claims 10 and 17 to correct minor errors. Accordingly, Applicant respectfully submits that no new matter is added.

In the above-identified Office Action, the Examiner indicated that the specification and drawings were objected to. Applicant has amended the specification and figures in order to address the Examiner's objection. Thus, Applicant has attached hereto redlined Figures 1, 5 and 7. With respect to the Examiner's objection to step 620, the objects 502 and 504 are to be in focus, while the objects 506 and 508 are to be out of focus. Specification, page 13, lines 10-12. The discussion on page 14, line 16-page 15, line 10 indicates that the determination of whether the objects 506 and 508 in the background are too close or are in focus in step 620 includes determining "whether the objects 506 and 508 are within a particular distance from the focus zone 552." Specification, page 14, lines 20-22. Thus, step 620 includes determining whether the objects are not sufficiently out of focus.

In the above-identified Office Action, the Examiner objected to claims 8, 10 and 17. Applicant has canceled claim 8. Applicant has also amended claims 10 and 17 to make the corrections suggested by the Examiner. Accordingly, Applicant respectfully submits that the Examiner's objections have been addressed.

In the above-identified Office Action, the Examiner rejected claims 1-2, 4-8, 10-11 and 13-21 under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 6,067,114 ("Omata") in view of U.S. Patent No. 4,826,301 ("Ikemori"). The Examiner also rejection claims 3 and 12 under 35 U.S.C. § 103 as being unpatentable over Omata in view of Ikemori in further view of U.S. Patent No. 5,825,016 ("Nagahata"). The Examiner also rejected claims 9 and 22 under 35 U.S.C. § 103 as being unpatentable over Omata in view of Ikemori and Nagahata.

In the above-identified Office Action, the Examiner rejected claims 1-2, 4-8, 10-11 and 13-21 under 35 U.S.C. § 103 as being unpatentable over Omata in view of Ikemori.

Applicant respectfully traverses the Examiner's rejection. Independent claims 1, 10 and 19 recite a method, system and computer-readable medium for capturing an image. The image is associated with a focus zone and includes a plurality of objects, each of which is a corresponding distance from the imaging device. If the image matches certain criteria, particularly the size and proximity of certain objects, then it is determined whether at least one of the objects, which is preferably in the background, is sufficiently out of focus. If so, it is determined whether the focus zone can be shifted so that that the at least one object is out of focus. The focus zone can then be shifted so that the object is out of focus. As a result, the image can be placed in soft focus, where possible.

Applicant agrees that Omata fails to teach shifting the focus zone so that the at least one object is out of focus. Instead, Omata describes classifying objects in the image based on the size and proximity of objects, detecting compositional changes, such as an object being moved from the center to the edge of the image, and providing a continuous focus to ensure that the object the operator intends as the subject remains in focus. Omata, col. 1, line 40-col. 2, line 2. Consequently, Omata is concerned with tracking an object that is in focus, so that the subject of the image brought into focus stays in focus.

Ikemori does describe a system which is used to provide a soft focus. The system of Ikemori does so by introducing a spherical aberration into the image. Ikemori, col. 11, lines 34-40. Ikemori teaches that the spherical aberration is introduced by moving one of the lenses in the system of Ikemori. Ikemori, Abstract, lines 5-11. The focus of the image is then readjusted using another lens. Ikemori, col. 3, lines 7-17. However, Applicant can find no mention in Ikemori of shifting the focus zone in order to provide a soft focus (ensuring that one or more objects are out of focus). Furthermore, Ikemori is devoid of mention of determining whether the focus zone can be shifted sufficiently to ensure that certain objects in the image are out of focus (i.e. in soft focus).

Thus, if the teachings of Ikemori are added to those of Omata, the image capture device of Omata might provide a soft focus by introducing spherical aberrations using one of the lenses of Ikemori. The combination might also readjust the focus using another of the lenses of Ikemori. However, the combination would not determine whether the focus zone could be shifted a sufficient amount. nstead, as described above, the combination would simply introduce

spherical aberrations. Thus, Omata in view of Ikemori fail to teach or suggest determining whether the focus zone can be shifted a sufficient amount to ensure that some objects are out of focus and shifting the focus zone. Therefore, Omata in view of Ikemori does not teach or suggest the method, image capture device, and computer readable medium recited in claim 1, 10 and 19. Accordingly, Applicant respectfully submits that claims 1, 10 and 19 are allowable over the cited references.

Claims 2 and 4-8 depend upon independent claim 1. Claims 11 and 13-18 depend upon independent claim 10. Claim 20-21 depend upon independent claim 19. Consequently, the arguments herein apply with full force to claims 2, 4-8, 11, 13-18 and 20-21. Accordingly, Applicant respectfully submits that claims 2, 4-8, 11, 13-18 and 20-21 are allowable over the cited references.

The Examiner also rejection claims 3 and 12 under 35 U.S.C. § 103 as being unpatentable over Omata in view of Ikemori in further view of Nagahata.

Applicant respectfully traverses the Examiner's rejection. Claim 3 and 12 depend upon independent claims 1 and 10, respectively. Consequently, the arguments herein apply with full force to claim 3 and 12. In particular, Omata in view of Ikemori fail to teach or suggest determining whether the focus zone can be shifted a sufficient amount to ensure that some objects are out of focus and shifting the focus zone.

Nagahata fails to remedy the defects of Omata in view of Ikemori. The cited portions of Nagahata do describe a foreground and a background, with objects in the foreground being closer. However, Applicant can find no mention in Nagahata of determining whether the focus

zone can be shifted a sufficient amount to ensure that some objects are out of focus and shifting the focus zone. Consequently, if the teachings of Nagahata are added to those of Omata and Ikemori, the combination might characterize certain objects as being in the foreground and others as being in the background. However, the combination would still fail to determine whether the focus zone can be shifted a sufficient amount to ensure that some objects are out of focus and then shift the focus zone. Consequently, Omata in view of Ikemori in further view of Nagahata fail to teach or suggest the method and image capture device recited in claims 1 and 10.

The Examiner also rejected claims 9 and 22 under 35 U.S.C. § 103 as being unpatentable over Omata in view of Ikemori and Nagahata.

Applicant respectfully traverses the Examiner's rejection. Claims 9 and 22 recite a method and computer-readable medium, respectively, including the steps of determining whether the focus zone can be shifted a sufficient amount to ensure that some objects are out of focus and shifting the focus zone if the focus zone can be shifted a sufficient amount. Consequently, the arguments herein apply with full force to claims 9 and 22. Consequently, Omata in view of Ikemori in further view of Nagahata fails to teach or suggest the method and computer-readable medium recited in claim 9 and 22. Accordingly, Applicant respectfully submits that claims 9 and 22 are allowable over the cited references.

New claims 23, 24, 25, 26 and 27 depend upon independent claim 1, 9, 10, 19 and 22, respectively. Consequently, the arguments herein apply with full force to claims 23-27. Accordingly, Applicant respectfully submits that claims 23-27 are allowable over the cited references.

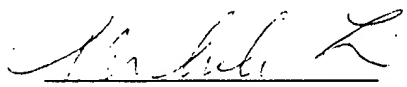
Claim 23-27 are also separately allowable over the cited references. Claims 23-27 recite a methods, an image capture device and computer-readable media that adjust an aperture size to shorten the focus zone if it is determined that the focus zone cannot be shifted so that the at least one object is out of focus. Applicant has found no mention in the cited references of adjusting the aperture size to change the focus zone if the focus zone cannot be shifted so that the at least one object is out of focus. Consequently, any combination of the cited references would not teach or suggest this feature. Accordingly, Applicant respectfully submits that claims 23-27 are allowable over the cited references.

Accordingly, for the above-mentioned reasons, Applicant respectfully submits that the claims are allowable over the cited reference. Consequently, Applicant respectfully requests reconsideration and allowance of the claims as currently presented.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned **"Version with markings to show changes made"**.

Applicant's attorney believes that this application is in condition for allowance. Should any unresolved issue remain, the Examiner is invited to call Applicant's attorney at the telephone number indicated below.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

Page 5, line 18

CPU 344 may include a conventional microprocessor device for controlling the operation of camera 110. In the preferred embodiment, CPU 344 is capable of concurrently running multiple software routines to control the various processes of camera 110 within a multithreaded environment. For example, images may be captured at the same time that previously captured images are processed in the background to effectively increase the capture rate of the camera. In a preferred embodiment, CPU [244]344 runs an operating system that includes a menu-driven GUI and provides image processing through software, rather than hardware. An example of such software is the Digita™ Operating Environment by FlashPoint Technology of San Jose, California. Although CPU 344 is preferably a microprocessor, one or more DSP□s (digital signal processor) or ASIC□s (Application Specific Integrated Circuit) could also be used.

Page 7, line 22

Figures 2A and 2B are diagrams depicting exemplary hardware components of the camera's user interface 408. Figure 2A is back view of the camera 110 showing the LCD screen 402, a four-way navigation control button 409 having directional arrows 410a, 410b, 411a and 411b, an overlay button 412, a menu button 414, and a set of programmable soft keys 416. Figure 2B is a top view of the camera 110 showing a shutter button 418, and a mode dial 420. The camera may optionally include status LCD 406, status LCD scroll and

select buttons 422 and 424, a sound record button 426, and zoom-in, zoom-out buttons 426a and 426b.

Page 10, line 21

Figure 3B depicts a side view of the scene captured in the image 500 and the digital camera 110. The objects 502 and 504 are relatively close to the camera 110. The close objects are considered to be in the foreground 554 of the image. The object 506 is farther from the camera 110. The object 508 is very far from the camera 110 and, therefore, not depicted in Figure 3B. The objects 506 and 508 are considered to be in the background 556 of the image 500. Certain initial settings of the camera 110 are also indicated. The shutter (not shown) speed, focus distance 550, aperture (not shown), and, therefore, focus zone 552 are set. The focus distance 550 is distance from the image capture device which is most sharply in focus. The focus zone 552 is the range around the focus distance 550 in which objects will appear sharp and in focus. The range of the focus zone 552 may be limited by the conditions that the image 500 is taken under, such as the amount of light. Even when the aperture is set to obtain the smallest focus zone 552 which can be used, the focus zone 552 may include both the objects 502 and 504 and the object 506 which is farther from the camera 110. Not only the objects [503]502 and 504 but also the object 506 will appear in focus in the image 500 if the present invention is not utilized.

Page 12, line 11

If the image 500 is determined to match the criteria in step 602, it is determined if certain objects are in focus, via step 604. In a preferred embodiment, it is determined if objects 506 and 508 in the background 556 are in focus. If the objects 506 and 508 are in focus, then the focus zone 552 is shifted to ensure that the objects 506 and 508 are not in focus, via step [608]606. Preferably, the focus zone 552 is shifted by moving the camera lens (not shown) with respect to the remainder of the camera 110. This shortens the focus distance 550. In a preferred embodiment, step [608]606 is only performed only if the focus zone 552 can be shifted sufficiently to ensure that the objects 506 and 508 in the background are not in focus. In a preferred embodiment, the amount the zone 552 is shifted is greater than an amount required to make the nearest object 506 in the background 556 to be just outside the focus zone 552. This is because the amount of soft focus, or fuzziness of the objects 506 and 508 increases with increasing distance from the focus zone 552. The exact amount that the focus zone 552 is shifted, therefore, depends upon the criteria set for the desired amount of soft focus. The desired amount of soft focus may depend upon the manufacturer of the camera 110 or the user of the camera 110. Once the method 600 is completed, the image 500 is captured.

Page 13, line 18

The focus points of objects within the image 500 are determined, via step 612. The focus points are the distances at which each object 502, 504, 506, and 508 are best focused. In a preferred embodiment, this step is performed by focusing on objects starting at an infinite distance from the camera 110, and moving to objects close to the camera 110. Thus, in a

preferred embodiment, the objects 508 will be focused first, then the objects 506, then object 502, and then object 504. The initial aperture size, shutter speed, and focus distance 550 are then determined, via step 614. Setting the aperture size determines the focus zone 552. Based on the focus points determined in step 612 and the criteria set for the foreground and background, each object 502, 504, 506, and 508 is categorized as being in the foreground 554 or background 556, via step 616. As discussed above, the foreground 554 may be defined as a particular distance from the camera 110, such as three feet. It is then determined if the objects 502 and 504 in the foreground match the criteria set, via step 618. In a preferred embodiment, step 618 is performed by breaking the image 500 into zones. Data in the zones is then analyzed to determine which object 502, 504, 506, and 508 the data corresponds with, the total area of the image 500 occupied by each object 502, 504, 506, and 508, and the region of the image 500 in which each object 502, 504, 506, and 508 resides. Thus, it can be determined whether the object 502, 504, 506, and 508 is near the center or the edge of the image 500.

Page 15, line 2

If it is determined in step 620 that the objects 506 and 508 are not in focus, then via step 624 the focus zone 552 may be shifted only if the image 500 is very bright. Step 624 may be performed because when the image 500 is very bright, objects 506 and 508, which are well outside of the focus zone 552 and would have a sufficiently soft focus if less light were available, are actually in focus. However, step 624 is optional. If it is determined in step 620 that the objects 506 and 508 are in focus, then the focus zone is shifted, via step 622. In a preferred

embodiment, step 622 is performed by calculating the amount the focus distance 550 should be offset, and shifting the focus zone 552 that amount. [The]Then, via step 626 the image 500 may be captured.

Page 15, line 11

For clarity, Figure 6A depicts a graph of the focus versus the reciprocal of the distance from the camera 110 for each object 502, 504, 506, and 508. The plot 652 is the focus versus the reciprocal of the distance from the camera 110 for the object 502. The plot 654 is the focus versus the reciprocal of the distance from the camera 110 for the object 504. The plot 656 is the focus versus the reciprocal of the distance from the camera 110 for the object 506. [The plot 656 is the focus versus the reciprocal of the distance from the camera 110 for the object 506.] The distances at which the peaks in the plot 652, 654, 656, and 658 occurs corresponds to the focus points for the objects 502, 504, 506, and 508, respectively. Thus, the objects 502 and 504 are in the foreground 556, while the objects 506 and 508 are in the background 558 of the image 500.

Page 16, line 9

Figure 7 depicts a more detailed flow chart of a preferred method 700 in accordance with the present invention. [ ]The feature that will allow the focus zone 552 to be shifted is selected by the user or automatically by the camera, via step 702. The camera 110 then performs a focus scan to obtain the focus points for the objects 502, 504, 506, and 508 within the image 500, via step 704. Preferably, this scan commences at an infinite distance from the camera 110

and completes very close to the camera 110. Also in step 704, data for all objects 502, 504, 506, and 508 is collected for each zone 670 through 693 during the focus scan. The graph depicted in Figure 6A could be generated from the data collected in step 704.

Page 16, line 18

The data for the zones 670 through 693 is then analyzed to determine if the image 500 matches a set of criteria, via step 706. In a preferred embodiment, the analysis in step 706 includes categorizing objects 502, 504, 506, and 508 as being in the foreground 556 or the background 558. Also in a preferred embodiment, the foreground is defined a set distance from the camera. In the preferred embodiment, there are several criteria. The first criterion is that the image 500 include at least one object, such as objects 502 and 504, which is close to the camera 110. Preferably, close is defined as a particular distance from the camera 110, such as three feet. A second criterion is that at least one object within the background 558 be near the object or objects 502 and 504 in the foreground 554.[.] In a preferred embodiment, this second criterion is that the focus point of at least one object within the background 556 be within a certain distance from the focus point of an object 502 or 504 in the foreground 554. A third criterion is that the close object or objects occupy a large amount of the image. In one embodiment, the objects 502 and 504 should occupy at least twenty percent of the image 500. A fourth criterion is that the close objects or objects be relatively centered in the image 500.

IN THE CLAIMS:

1. (Amended) A method for capturing an image using an image capture device, the image capable of including a plurality of objects, each of the plurality of objects being a corresponding distance from the imaging device, the image being associated with a focus zone, method comprising the steps of:

(a) determining if the image matches at least one criteria;

(b) determining whether at least one of the plurality of objects is out of focus if the image matches the at least one criteria;

(c) determining whether the focus zone can be shifted so that that the at least one object is out of focus if the at least one object is not out of focus; and

([c]d) shifting the focus zone so that the at least one object is out of focus if at least one of the plurality of subjects is not out of focus.

7. (Amended) The method of claim 1 wherein the step of shifting the focus zone (c) further includes the step of:

([c]d1) shifting the focus zone so that the at least one object is outside of the focus zone if the focus zone can be shifted so that the at least one object is outside of the focus zone.

Please cancel claim 8.

9. (Amended) A method for allowing an image having a center to be captured by an

imaging device, the image capable of including a plurality of objects, each of the plurality of objects being a corresponding distance from the imaging device, the method comprising the steps of:

(a) determining if the image matches a plurality of criteria, the step of determining if the image matches the plurality criteria further including the steps of:

(a1) determining the corresponding distance for each of the plurality of objects;

(a2) categorizing the plurality of objects as being located in a foreground or a background based on the corresponding distance, the image matching a first criteria of the plurality of criteria if a first object in foreground has a first corresponding distance and a second object in the background has a second corresponding distance;

(a3) separating the image into a plurality of zones;

(a4) analyzing the image in each of the plurality of zones to determine an amount of the image which each of the plurality of objects occupies, the image matching a second criteria of the plurality of criteria if the first object occupies a particular amount of the image;

(a5) analyzing the image in each of the plurality of zones to determine if the first object in the foreground is in proximity to the center of the image, the image matching a third criteria of the plurality of criteria if the first object is in proximity to the center of the image;

(b) determining whether the second object is out of focus if the image matches the at least one criteria;

(c) determining a focus zone;

(d) determining whether the focus zone can be shifted so that that the at least one object is out of focus if the at least one object is not out of focus; and

([d]e) shifting the focus zone so that the at least one object is out of focus if at least one of the plurality of subjects is not out of focus and if the focus zone can be shifted so that the at least one object is out of focus.

10. (Amended) An image capture device [image] for capturing an image capable of including a plurality of objects, each of the plurality of objects being a corresponding distance from the imaging device, the image being associated with a focus zone, the image capture device comprising:

means for determining if the image matches at least one criterion;

means for determining whether at least one of the plurality of objects is out of focus if the image matches the at least one criteria;

means for determining whether the focus zone can be shifted so that that the at least one object is out of focus if the at least one object is not out of focus; and

means for shifting the focus zone so that the at least one object is out of focus if at least one of the plurality of subjects is not out of focus.

17. (Amended) The image capture device of claim 16 wherein the means for shifting the focus zone further includes:

means for adjusting the shifting of the focus zone so that the focus zone can be shifted so

that at least one object is outside of the focus zone if the at least one of the plurality of subjects is not out of focus.

19. (Amended) A computer-readable medium containing a program for capturing an image capable of including a plurality of objects, each of the plurality of objects being a corresponding distance from the imaging device, the image being associated with a focus zone, program including instructions for:

determining if the image matches at least one criterion;

determining whether at least one of the plurality of objects is out of focus if the image matches the at least one criterion;

determining whether the focus zone can be shifted so that that the at least one object is out of focus if the at least one object is not out of focus; and

shifting the focus zone so that the at least one object is out of focus if at least one of the plurality of subjects is not out of focus.

22. (Amended) A computer-readable medium containing a program for capturing an image having a center to be captured by an imaging device, the image capable of including a plurality of objects, each of the plurality of objects being a corresponding distance from the imaging device, the program containing instructions for:

determining if the image matches a plurality of criteria, the instructions for determining if the image matches the plurality criteria further including instruction for:

determining the corresponding distance for each of the plurality of objects;

categorizing the plurality of objects as being located in a foreground or a background based on the corresponding distance, the image matching a first criterion of the plurality of criteria if a first object in foreground has a first corresponding distance and a second object in the background has a second corresponding distance;

separating the image into a plurality of zones;

analyzing the image in each of the plurality of zones to determine an amount of the image which each of the plurality of objects occupies, the image matching a second criterion of the plurality of criteria if the first object occupies a particular amount of the image;

analyzing the image in each of the plurality of zones to determine if the first object in the foreground is in proximity to the center of the image, the image matching a third criterion of the plurality of criteria if the first object is in proximity to the center of the image;

determining whether the second object is out of focus if the image matches the at least one criterion;

determining a focus zone;

determining whether the focus zone can be shifted so that that the at least one object is out of focus if the at least one object is not out of focus; and

shifting the focus zone so that the at least one object is out of focus if at least one of the plurality of subjects is not out of focus and if the focus zone can be shifted so that the at least one object is out of focus.